cific than exercise electrocardiography (ExECG) in women, the clinical and cost implications of incorporating ExE in the evaluation of suspected coronary artery disease (CAD) in women has not been well resolved. The aim of this study was to assess the accuracy, angiography rate, and cost of various diagnostic strategies in women. A consecutive group of 161 female patients (age 60 ± 9 yrs) underwent ExECG, ExE and coronary angiography. Positive ExECG was defined as >0.1 mV ST depression, and positive ExE was defined by a new or worsening wall motion abnormality. Sensitivity (sens) and specificity (spec) were calculated by comparison of ExE (sens 79%, spec 81%) and ExECG (sens 77%, spec 56%) with angiography (significant stenosis > 50%). Pre-test CAD probability (44 ± 33%) was calculated from age and symptoms. Seven different strategies (see table) involving angiography, ExECG ExE, selective combination (ExE for nondiagnostic ExECG), stepwise combination (ExE for positive or nondiagnostic ExECG), and Bayesian approaches (all high pre-test CAD probability pts undergoing angiography, intermediate probability pts undergoing angiography, if ExE or ExECG positive);

Strategy	Cost/pt ($)	Angio (%)	Negative angio (%)	FalseNeg%
I Angiography	1,434	100	63	0
II Exercise ECG	1,023	69	56	11
III Exercise Echo	828	41	29	13
IV Selective ECG/echo	836	51	44	14
V Stepwise ECG/echo	663	31	26	22
VI Bayesian ECG	745	37	27	25
VII Bayesian ExEcho	641	51	48	29

Use of ExE in all pts, with angiography only with positive ExE (III) involved less angiography and was less expensive at a similar level of accuracy to I and II. Strategy IV is least expensive but would lead to an unacceptable number of false negatives. The Bayesian approaches are compromised by the limitations of clinical stratification of women into high and low probability groups based on symptoms. *Conclusion:* The greater spec of ExE in women avoids inappropriate angiography. Use of ExE as an initial test for CAD in women is justifiable on cost grounds.

901-55 Comparison of Dobutamine Echocardiography with Positron Emission Tomography for the Assessment of Hibernating Myocardium

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Dobutamine infusion during echocardiographic imaging (DE) has been proposed as an alternative to Positron Emission Tomography (PET) for the assessment of hibernating myocardium. The *purpose* of this study was to compare the two techniques for the detection of hibernating myocardium in a canine model. Six dogs underwent ligation of the left anterior descending (LAD) coronary artery and placement of sonomicrometer crystals in the area subtended by the distal LAD and circumflex coronary artery. The animals were subsequently brought back to the lab for a series of 4 DE (3 days, 1–2–4 weeks post ligation) during which dobutamine (2.5–30 μg/kg/min) was given with continous echocardiographic and sonomicrometric monitoring. Just prior to the last DE a PET scan was performed utilizing F-18 FDG and N-13 NH3. Following the final DE the LAD was bypassed and flow restored. The myocardium was defined as hibernating if there was improvement in wall motion (echo), or segment shortening (sonomicrometer) following bypass. By PET viable myocardium was defined as normal or mildly decreased activity of FDG in the infarct zone. At the conclusion of the protocol the animals were sacrificed and the heart excised, sliced into sections and stained with TTC to determine myocardial infarct size. The *results* are summarized in the table where (S) = sono, (E) = echo, (P) = PET, (+) = viable, and (−) = nonviable.

Dog 1	S−	E−	P−
Dog 2	S+	E+	P+
Dog 3	S−	E−	P−
Dog 4	S+	E+	P+
Dog 5	S+	E+	P+
Dog 6	S−	E−	P+

Thus there was agreement between all tests in 5/6 animals. In Dog 6 there was agreement between S and E but not P. In this animal a transmural infarction was found by TTC staining and there was no improvement in function following bypass. *Conclusion:* There is good concordance between DE and PET for the assessment of hibernating myocardium. PET FDG may be overly sensitive for the detection of functional recovery following revascularization.

901-56 Contrast Echocardiography Detects the Development Coronary Collateral Blood Flow: Validation in a Porcine Model of Gradual Coronary Occlusion

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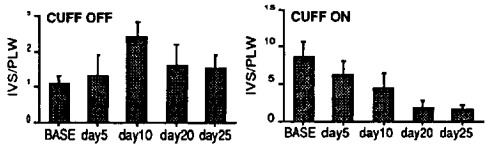
Few data exist directly documenting the ability of contrast echo (CE) to demonstrate the presence and development of coronary collaterals. Therefore, we performed serial CE in 5 closed chest awake pigs in whom an ameroid constrictor placed around the proximal LCx produced total occlusion and development of collateral flow gradually over 3 weeks. A second inflatable cuff constrictor was placed distal to the ameroid for acute occlusion. Short axis echos during left atrial injections of 1 gram of SHU 504 (Levovist) were performed with and without inflation of the acute occluder at baseline, 5, 10, 20, and 25 days. Ameroid occlusion produced only a transient contractile abnormality: posterolateral wall thickening was 71, 39, and 67% at BASE, 10, and 25 days. With the acute cuff occluder open, interventricular septum (IVS) opacification was dense during all studies, while posterolateral wall (PLW) intensity was dense at BASE, decreased markedly at 10 days, and increased again at 25 days as collaterals developed. Acute inflation of the cuff resulted in a clear PLW perfusion deficit during BASE to day 10, which improved significantly at day 25. We measured videointensity (gray levels) from a 0.3 cm^2 region of interest in the mid IVS and PLW. The ratio of IVS/PLW intensity increased on day 10 as the constrictor occluded, and then decreased on day 25 as collaterals developed, even with the acute cuff inflated (Figure). Thus, in a porcine model in which gradual coronary occlusion induces collaterals, CE demonstrates opacification of the involved myocardium. These data document the ability of CE to identify and track the development of coronary collateral flow.



ELECTROPHYSIOLOGY ARRHYTHMIAS — CLINICAL — SUPRAVENTRICULAR

901-57 Anomalies of the Coronary Venous System in Patients with and without Accessory Pathways

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Anomalies of the coronary sinus (CS) were recently reported in association with accessory pathways (APs). In this prospective study, we analyzed the incidence of such anomalies in patients with and without an AP. A total of 124 consecutive pts (48 f, 76 m; 43 ± 14 yrs) were investigated; 44 had a left free wall AP, 33 a posteroseptal AP (10 right; 19 left; 4 without precise location due to failed RFC ablation) and 13 a right sided AP (7 anteroseptal; 6 right free wall). The remaining 34 pts were studied for AV nodal reentry tachycardia in 19 cases and for ventricular or atrial arrhythmias in 15 cases. Coronary artery disease was present in 7 pts. Retrograde CS angiography was performed using a 6-French catheter. *Results:* A total of 11 anomalies was found, 6 of which were CS diverticula (DIV) and 5 were a persistent superior vena cava (PSVC). All were found in pts with APs. 4 DIV were in the posteroseptal (ps) and 1 in the posterior region of the CS. In 4 pts the AP could be abolished from the neck of the DIV, in 2 pts the right ps AP had no association to the ps CS DIV. 4 DIV drained into the CS and 1 directly into the right atrium. 4 DIV were spherical, 1 DIV elliptical and 1 DIV cauliflower-like shaped. The size differed between 1.0 × 1.8 and 3.4 × 2.5 cm. 4 pts with the PSVC had a left lateral AP, which could be ablated using the ventricular approach to the mitral valve annulus. 1 pt had a right anteroseptal AP, which could be ablated from the right atrium.

Conclusions: 1. DIV of the CS are most likely present in patients with left-sided APs. 2. In most cases, an AP is associated with the neck of the DIV. The association between anomalies of the venous system and those of the AV conduction system could be based on combined failures in the embryologic development.